What is claimed is:

1. Piezoelectric single crystal element which is provided with electrodes for excitation on at least one face or on opposing faces and is excitable to produce a thickness shear vibration, wherein said single crystal element has a crystal cut with a fundamental resonance frequency excitable in a thickness shear mode, in which the effective electromechanical coupling factor k_{eff} is between 0.05% and 3%.

2. Piezoelectric single crystal element according to claim 1, wherein said electromechanical coupling factor k_{eff} is between 0.1% and 2%.

3. Piezoelectric single crystal element according to claim 1, wherein the frequency spacing to the nearest excitable anharmonic resonance frequency amounts to >80 kHz.

4. Piezoelectric single crystal element according to claim 3, wherein the frequency spacing to the nearest excitable anharmonic resonance frequency amounts to >100 kHz.

5. Piezoelectric single crystal element according to claim 1, wherein maximum admittance of the harmonics is <10% relative to said fundamental resonance frequency.

6. Piezoelectric single crystal element according to claim 5, wherein maximum admittance of the harmonics is <5% relative to said fundamental resonance frequency.

7. Piezoelectric single crystal element according to claim 1, wherein said single crystal element is tempered at temperatures of more than 150°C.

8. Piezoelectric single crystal element according to claim 1, wherein the effective thermal expansion coefficients in the plane of said crystal cut deviate from each other by a factor <1.5.

9. Piezoelectric single crystal element according to claim 1, wherein the linear temperature coefficient of said fundamental resonance frequency amounts to zero at least at one point in the region of a operating temperature of said piezoelectric single crystal element.

10. Piezoelectric single crystal element according to claim 9, wherein said operating temperature is in the range of 10°C to 100°C.

11. Piezoelectric single crystal element according to claim 1, wherein said single crystal element consists of a crystal belonging to crystallographic point group 32.

12. Piezoelectric single crystal element according to claim 11, wherein said crystal element consists of quartz-homeotypic gallium orthophosphate ($GaPO_4$).

13. Piezoelectric single crystal element according to claim 12, wherein the crystal element is a singly rotated Y-cut with a rotation angle ϕ between -80° and -88°.

14. Piezoelectric single crystal element according to claim 13, wherein said rotation angle ϕ is between -82° and -86°.

15. Piezoelectric single crystal element according to claim 11, wherein said crystal element consists of at least one crystal material selected from a group consisting of langasite ($La_3Ga_5SiO_{14}$), langanite ($La_3Ga_{5,5}Nb_{0,5}O_{14}$), and langatate ($La_3Ga_{5,5}Ta_{0,5}O_{14}$).

16. Piezoelectric single crystal element according to claim 15, wherein the crystal element is a singly rotated Y-cut of langasite ($La_3Ga_5SiO_{14}$), with a rotation angle ϕ between -55° and -85°.

17. Piezoelectric single crystal element according to claim 16, wherein said rotation angle ϕ is between -60° and -70°.

18. Piezoelectric single crystal element according to claim 1, wherein said single crystal element consists of a crystal belonging to crystallographic space group P321.

19. Piezoelectric single crystal element according to claim 18, wherein said crystal element consists of strontium-gallium-germanate ($Sr_3Ga_2Ge_4O_{14}$).

20. Method for manufacture of a piezoelectric single crystal element which is excitable in a thickness shear mode, comprising the steps of producing a crystal cut with an excitable fundamental resonance frequency, having an effective electromechanical coupling factor k_{eff} lying between 0.05% and 3%, and applying electrodes for excitation on at least one face or on opposing faces of said single crystal element.

21. Method according to claim 20, wherein said electromechanical coupling factor k_{eff} laying between 0.1% and 2%.

22. Method according to claim 20, wherein said crystal element is heated to temperatures of more than 150°C during application of said electrodes.

23. Method according to claim 20, wherein said crystal element is subject to a thermal treatment of more than 150°C after application of said electrodes.

24. Use of a piezoelectric crystal element according to claim 1, as a pressure gauge at vacuum pressures of less than 10 mbar.

25. Use of a piezoelectric crystal element according to claim 1, as a frequency-determining element in oven-controlled or thermostatted oscillators.

26. Use of a piezoelectric crystal element according to claim 1, as a microbalance sensor element, at vacuum pressures <10 mbar.

27. Use of a piezoelectric crystal element according to claim 1, as an electronic filter with high slope steepness.

28. Use of a piezoelectric crystal element according to claim 20, as a pressure gauge at vacuum pressures of less than 10 mbar.

29. Use of a piezoelectric crystal element according to claim 20, as a frequency-determining element in oven-controlled or thermostatted oscillators.

30. Use of a piezoelectric crystal element according to claim 20, as a microbalance sensor element, at vacuum pressures <10 mbar.

31. Use of a piezoelectric crystal element according to claim 20, as an electronic filter with high slope steepness.